

38. On Specimens of Cuvier's Whale (*Ziphius cavirostris*) from the Irish Coast. By SIDNEY F. HARMER, Sc.D., F.R.S., F.Z.S., Keeper of Zoology in the British Museum*.

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INDEX.

GEOGRAPHICAL:	Page
New records of the occurrence of <i>Ziphius cavirostris</i> in British waters	559, 561
Distribution.....	560
STRUCTURE, ETC.:	
Coloration and skin-markings	562
Teeth.....	560, 562, 564
Sexual differences	563
SYSTEMATIC:	
The Irish specimens belong to <i>Z. cavirostris</i>	565

Among the Cetacea included in lists of the British species, the subject of this notice is one on which further information is specially desirable. Its claim to be regarded as British was established by Professor (now Sir William) Turner (1872, 1912), on the evidence of a skull obtained off Hamna Voe, Northmaven, Shetland, and now in the Anatomical Museum of the University of Edinburgh. So far as I have been able to ascertain, this is the only authenticated record of the occurrence of *Ziphius cavirostris* in the British area. Van Beneden indeed states (1888, pp. 87, 91) that a male specimen of this species was stranded on the Irish Coast (place and date not indicated), and that its skeleton is in a Dublin Museum. In order to obtain information with regard to this record I wrote to Dr. R. E. Scharff, Keeper of the Natural History Collections in the National Museum, Dublin, who has been good enough to inform me that he knows nothing whatever of the supposed *Ziphius*, and suggests that Van Beneden may have mistaken a record of an Irish *Mesoplodon bidens* for one of *Ziphius cavirostris*. He assures me that the National Museum at Dublin possesses no skeleton of *Ziphius* or any part of one; and that he has satisfied himself that no such skeleton exists in the Museum of the Royal College of Surgeons, Dublin, or in that of Trinity College, Dublin.

Although I am thus unable to ascertain what was the evidence on which Van Beneden's statement was made, I am in a position to record the occurrence of two undoubted specimens of *Z. cavirostris* on the Southern Coast of Ireland. The circumstances under which these have been obtained by the British Museum lead me to suspect that the species is not so uncommon a visitor

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to our shores as has hitherto been supposed*. It seems not improbable that a certain proportion of the Cetacea recorded as "Bottle-nosed Whales" belong either to this species or to the allied genus *Mesoplodon*, of which two species appear to occur in our seas, namely Sowerby's Whale (*M. bidens*) and *M. europæus* Gervais, the validity of which has been the subject of much dispute, but which, from the evidence recently given by the late Mr. F. W. True (1910, p. 11), has considerable claims to be regarded as distinct from *M. bidens*.

The adult males of Ziphioid Whales usually possess one or two pairs of large and conspicuous teeth, either at the extreme anterior end of the lower jaw or further back in the same jaw: and in most of the species these teeth form a conspicuous feature of the animal in the flesh. In young specimens of either sex and even in adult females, the corresponding teeth do not cut the gum, in most of the species; and a living specimen thus appears to be completely edentulous. While the adult male of the Common Bottle-nosed Whale (*Hyperoodon rostratus*) is characterised by its remarkably swollen forehead, this feature is absent from the females at all ages, as is shown in the figure given by Capt. David Gray (1882, p. 728). When it is remembered that the coloration of the skin is very variable, both in *Hyperoodon* and in *Ziphius*, it will be realised that the external differences between apparently edentulous specimens of these two genera are not so striking as to preclude mistakes in determination by observers who have not had considerable experience. In order to obtain any certainty with regard to the determination of Ziphioid Whales it is thus desirable to scrutinise most carefully the evidence relating to reputed "Bottle-nosed Whales."

The considerable number of records of the occurrence of *Ziphius* in the most widely separated localities, taken in conjunction with the evidence supplied by some of the best authorities that but a single recent species has been proved to exist, leads to the conclusion that *Z. cavirostris* is a cosmopolitan species which inhabits the open oceans of the world and is occasionally stranded. It does not follow that it is in reality a rare animal. If the conclusion that but one living species occurs be correct, the species has an almost world-wide distribution, since it has been recorded not only on both sides of the Atlantic and in the Mediterranean, but also in such widely separated localities as South Africa, New Zealand, and Bering Sea.

In 1912 the Board of Trade issued instructions to Receivers of Wreck to inform the British Museum of the stranding of Cetacea

* It is not impossible that two living Whales which were observed from the cliff at Great Saltee Island, Co. Wexford, June 15, 1913, by Mr. W. P. Pycraft, in company with the late Mr. R. M. Barrington and Mr. W. W. Grant, may have belonged to *Z. cavirostris*. Mr. Pycraft has kindly given me a copy of the notes which he made at the time, according to which all three observers were struck by the remarkably white appearance of the fore part of the body, and were agreed that this was not due to the effect of brilliant sunshine reflected from a black surface. The hinder part of the body was evidently darker than the front part. It will be noticed that this account is in complete agreement with the observations recorded below on the coloration of the Wexford *Ziphius* stranded on July 19, 1915.

along the British Coasts; and as the result of this action a number of telegraphic intimations of such occurrences have been sent to the Museum from time to time. The telegrams thus despatched have in many cases been supplemented by written Reports, sketches, or photographs; and often by the transmission of lower jaws or other parts of the specimens stranded. From the information thus obtained two Reports have already been published by the Trustees of the British Museum (Harmer, 1914, 1915). For the assistance given to this enquiry by Receivers of Wreck and Coastguard officers I wish to express my most cordial thanks; and it is hardly necessary to add that a similar expression of gratitude is also due to the Board of Trade, by whose action the collection of this information has been rendered possible.

In receiving these telegraphic Reports the possibility of adding to our knowledge of the rarer Ziphioid Whales has throughout been borne in mind; and in particular it was hoped that opportunities would be afforded of obtaining specimens of *Ziphius cavirostris*. The inauguration of the scheme was more successful than was suspected at the time; since the very first specimen received after it came into full working order, namely the Whale recorded in my 1914 Report as 1913, No. 1 (Unionhall, Co. Cork), ultimately proved to be a specimen of the wished for *Ziphius*. This discovery was only made a few weeks ago, on removing the skeleton from the sand-pit in which it had been cleaned*; the specimen having at first been determined, on the evidence of its lower jaw, as a *Hyperoodon*.

On July 19 of the present year a telegram was received from the Coastguard officer at Fethard, Co. Wexford, announcing the stranding of a Whale, said to be 19 feet long and to have two teeth at the extremity of the jaw. It was supposed that this animal would prove to be a Common Bottle-nosed Whale (*Hyperoodon rostratus*); but the lower jaw was asked for in order to render its determination certain. On the arrival of the jaw, the pair of large and massive teeth at its anterior end showed at once that the animal was not a Common Bottle-nosed Whale, and it was more than suspected that it would prove to be a *Ziphius cavirostris*. Mr. A. H. Bishop, one of the preparators of the Museum, was accordingly sent to Fethard; and he was fortunately in time to secure the remainder of the skeleton, as well as to make observations on its external characters and to prove that it was a male. By a happy coincidence the skeleton of the 1913 specimen already alluded to was at this time removed from the sand; and the characters of its skull proved beyond doubt that, like the Fethard specimen, it was a *Ziphius cavirostris*. The British Museum is thus in possession of two Irish skeletons (the Unionhall specimen not quite complete) of this interesting

* For this method of cleaning skeletons, specially to be recommended for Cetacea, since it enables very large specimens to be dealt with without trouble, and moreover removes the oil from the bones, see R. F. Scharff, 'The Museums Journal,' x. 1911, p. 196.

Cetacean. When the skeleton of the Wexford specimen has been cleaned I hope to be able to publish a further account of these two animals, in conjunction with my friend Mr. W. P. Pycraft; but the records are interesting enough to justify the publication of a preliminary notice on the subject.

The Wexford specimen was stranded on July 18, 1915, at the entrance to Bannow Bay, on the east side of the point of land separating that Bay from Waterford Harbour; and it was alive when first observed. I am indebted to Mr. Dennis McCarthy, of H.M. Coastguard, for valuable information with regard to its appearance, as well as for the trouble he took in facilitating the acquisition of the specimen by the British Museum. In a written description sent after the despatch of the original telegram, Mr. McCarthy states that the lower jaw "was narrow and projected beyond the upper." The head was "mostly white in colour and along the upper part of the back as far as the fin with numerous whitish streaks running downwards in all directions; the remainder a darkish colour." This account is confirmed by Mr. Bishop, who made an excellent drawing of the animal, based on his photographs, measurements and notes, on his return to the Museum. This drawing represents the head, including the whole of the lower jaw, and part of the back as white in colour, the rest of the skin being black, or at least dark. The white colour extends over the whole of the head and part of the body, in front of an oblique line drawn from the anterior end of the dorsal fin, and passing in front of the pectoral fin, to the posterior end of the lower jaw. The colouring of this specimen is thus extremely similar to that of the New Zealand animal figured by von Haast (1880, pl. xxiii.). Much of the skin was covered by long, linear streaks, similar to those usually seen on the skin of *Grampus griseus*. According to the observations of Mr. Bishop, who did not see the specimen until July 23, when much of the epidermis had been lost, the streaks were arranged singly. In the specimen figured by von Haast the skin is said to have been marked with parallel, elongated streaks, in pairs, as well as with oval scars, each with two dots in the centre. These dots, and the two members of each pair of streaks were a constant distance apart, and were "evidently made by the teeth of other individuals of the same species."

One of the most striking features of the Wexford specimen was its possession of a pair of large and massive teeth, situated at the extreme end of the lower jaw, the left tooth being appreciably larger than its fellow. The exposed parts of these teeth are roughly conical, the teeth diverging from one another and being 20 mm. apart at their base. Other measurements of the exposed parts of the teeth are:—

	Right.	Left.
Antero-posterior diameter, at base...	32 mm.	36 mm.
Transverse diameter, at base	29	32
Length	34	42

The larger tooth thus has a diameter of nearly one and a half inches, while the part which projects beyond the gum exceeds one and three-fifths inches.

The teeth just described have a close resemblance to those of the specimen from the Chatham Islands, described and figured by Hector (1872, pl. v.) under the name of *Epiodon chathamensis*, now usually regarded as a synonym of *Z. cavirostris*. They are also precisely similar to those of a specimen, No. 21248, from Bering Island, described and figured by True (1910, p. 52, pl. xxii. fig. 4) and regarded by him (pp. 31, 35) as probably belonging to an adult male. It is important to notice that the Wexford specimen was definitely ascertained to be a male, from its characters in the flesh; and it thus confirms the accepted conclusion that the teeth of *Ziphius* are larger and more massive in the male than in the female. In the paper just cited (p. 54) True states his conclusion that adult males have "fusiform teeth with closed roots and a diameter of from 25 to 30 mm.," while in females they are "quite slender, with a diameter of from 10 to 14 mm."

The specimen* from Unionhall, Co. Cork, was stranded on Feb. 13, 1913; and it was described as much injured, being in an advanced state of decomposition, with most of its skin worn away. There are thus no observations to record with regard to its colour or sex. Its length is said to have been 20 feet. The lower jaw had a considerable resemblance to that of *Hyperoodon*; and, as there were no teeth piercing the gum, it was supposed that it belonged to that genus. The examination of the skull, two years later, at once corrected this mistake. The absence of the large maxillary crests which are so characteristic of *Hyperoodon* is alone sufficient to show that it cannot belong to that genus; while as features specially distinctive of *Ziphius* and possessed by this specimen, mention may be made of the peculiar form of the premaxillæ and the great difference between those of the two sides, as well as of the elongated nasals, separated from one another by a long suture. The length of the skull is about 3 feet 3 inches; the Shetland skull described by Turner (1912, p. 77) being 36½ inches long.

In his recent elaborate account of the cranial characters of *Z. cavirostris*, True (1910, p. 54) states his belief that the two sexes of this species are distinguishable from one another by certain well-marked cranial characters, in addition to those afforded by the teeth, as noted above. He admits, however, that the sex of some of the specimens from which his conclusions were drawn was not definitely known. The adult male was believed to be distinguishable by the great development of the "mesorostral ossification" (Turner) and by the presence of a deep "prenarial basin." In the adult female the mesorostral ossification is less developed, while the premaxillæ are narrow,

* For assistance in obtaining the skeleton of this specimen, the Museum is indebted to Mr. J. Phelan, of H.M. Coastguard, Unionhall.

and flat proximally (pp. 35, 36), and the premarial basin is undeveloped. It appears to me that these conclusions are well founded; and applying them to the Unionhall specimen, there seems every reason to believe that it was a female. This conclusion is strengthened by the fact that the teeth of the apex of the lower jaw do not cut the gum, although the dissection made by Mr. Pycraft proved that they are present and of considerable size, projecting for about 25 mm. beyond the bone of the jaw and nearly reaching the surface of the gum, and having a basal diameter of about 13.5 mm. It should be added, however, that the Unionhall specimen was not fully adult, since the sutures of the skull are still extremely distinct, while the epiphyses of the vertebræ are not yet ankylosed to the centra.

It would be extremely desirable to be able to state characters by which a *Ziphius* in the flesh can be distinguished certainly from the other Ziphioid Whales; but I am not prepared to do this without further study of the subject. In the case of the males, in their adult condition and probably at earlier stages of their life, the occurrence of a pair of large teeth at the extreme front end of the lower jaw and cutting the gum is probably amply sufficient for recognition, particularly when taken in conjunction with the absence of the enormously swollen forehead so characteristic of the adult male *Hyperoodon*. But a young Ziphioid Whale of either sex, or an adult female which has no teeth visible during life, is less easily referred to its proper genus.

It has already been pointed out that the Wexford specimen of *Z. cavirostris* and von Haast's New Zealand specimen (1880, pl. xxiii.) were white above and dark below—a type of coloration which is by no means common in Cetacea. Other specimens which have been referred to this species were, however, dark above, even on the head, and light below. Making full allowance for the uncertainty which so often prevails with regard to the real colour of Whales, owing to *post mortem* changes and to the fact that the examination frequently has to be made some time after death and under unfavourable conditions, it must be concluded, in the present state of the evidence, that *Z. cavirostris* is a species of very variable coloration (*cf.* True, 1910, p. 35). It may further be noted that according to Van Beneden (1888, p. 60) the rostrum and forehead of *Hyperoodon* become white in colour with age. The projection of the lower jaw beyond the tip of the snout is apparently a positive character of *Ziphius*; and the snout is probably less distinctly marked than in either *Mesoplodon* or *Hyperoodon*.

A further difficulty in defining the external characters of *Z. cavirostris* arises from the uncertainty which prevails with regard to the two mandibular teeth in the female. In some of the published accounts of this sex, these teeth are described as visible during life; while in the Unionhall specimen (probably a female) they were completely concealed beneath the gum.

It is hardly necessary to attempt to give a full account of the literature of the subject in this preliminary paper, but it may be convenient to refer to the lists of recorded occurrences given by Turner (1872, p. 770), Flower (1872, p. 207), Van Beneden (1888, p. 86), and True (1910, p. 30); the Memoir last cited giving far the fullest account of the general characters of the species at present published, and being accompanied by excellent figures of skulls and other parts of the skeleton.

With regard to published figures of the entire animal it may be noted that some of the earlier representations are so different from one another that, in the absence of other evidence, it would be hard to believe that they all represented the same species. Attention may, however, be directed specially to the following published illustrations:—

A Spanish specimen figured by Cabrera (1914, p. 380), who records three specimens from Santander, Bay of Biscay;

Specimens respectively from Alaska and Newport, Rhode Island, of which photographs are reproduced by True (1910, pl. xli. figs. 3, 4).

It may be noted finally that whether all recent specimens of *Ziphius* are referable to a single species or not, there is every reason to believe that the Irish specimens belong to *Z. cavirostris*; a conclusion reached with regard to the Shetland skull by Sir William Turner. This species was named by Cuvier (1823, p. 352) on the evidence of a skull obtained from the Bouches-du-Rhône, at first regarded as a fossil specimen, but shown by later writers to have been really that of a recent animal.

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